POIEX/HACEX system - The key to success

- Clinical results and points to consider -

Supervised by

Teruo Izumi, DDS
Yoshimi Kakumoto, DDS
Eiji Kato, DDS
Tetsuya Mizukami, DDS
Nobuyuki Yamamichi, DDS
Yuichi Yuuki, CDT
Kensuke Yoshitake, DDS

Japan Medical Materials Corporation

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I. Clinical evaluation of POIEX/HACEX system

Clinical results of POIEX/HACEX implants were evaluated five years after product launch.
The subject of the evaluation was 6,235 implants that were placed at 29 clinics between October 2005 and January 2010. The average clinical term of the clinical cases which followed up was 26.7 months (3-62 month).
Clinical results were collected from 29 clinics each of which had done 100 cases of implantation or more.

1. Survey protocol

The survey includes two steps of research.
In the primary research, clinical information such as implant position, size, type and present condition (i.e. working or failed) was collected. The cases in which the condition was unknown at the time of survey were excluded.
In the secondary research, failed cases were evaluated taking the factors into consideration including patient background, surgical technique, time to failure, and presumed cause of failure.

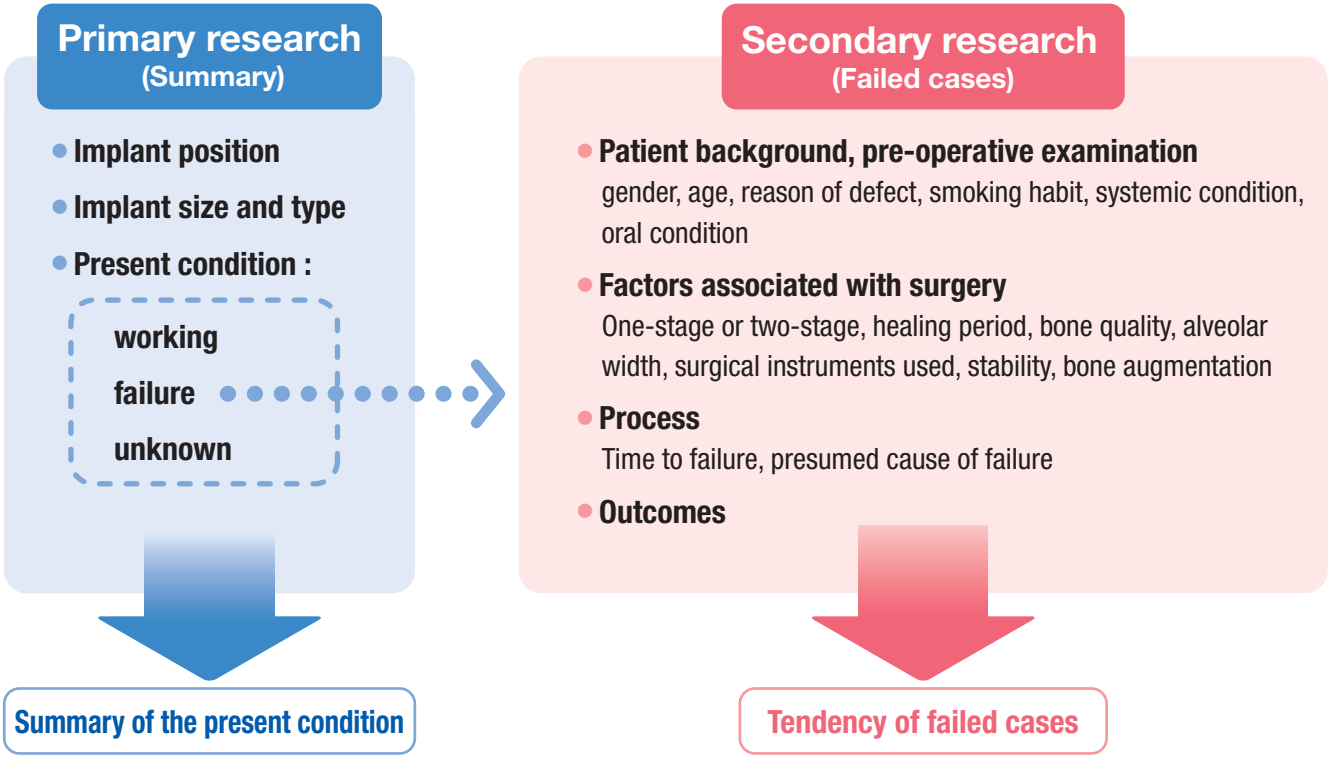


Fig.1 Basic protocol of survey

2. Breakdown of clinical cases

POIEX/HACEX usage rate by size, type, and position of placement

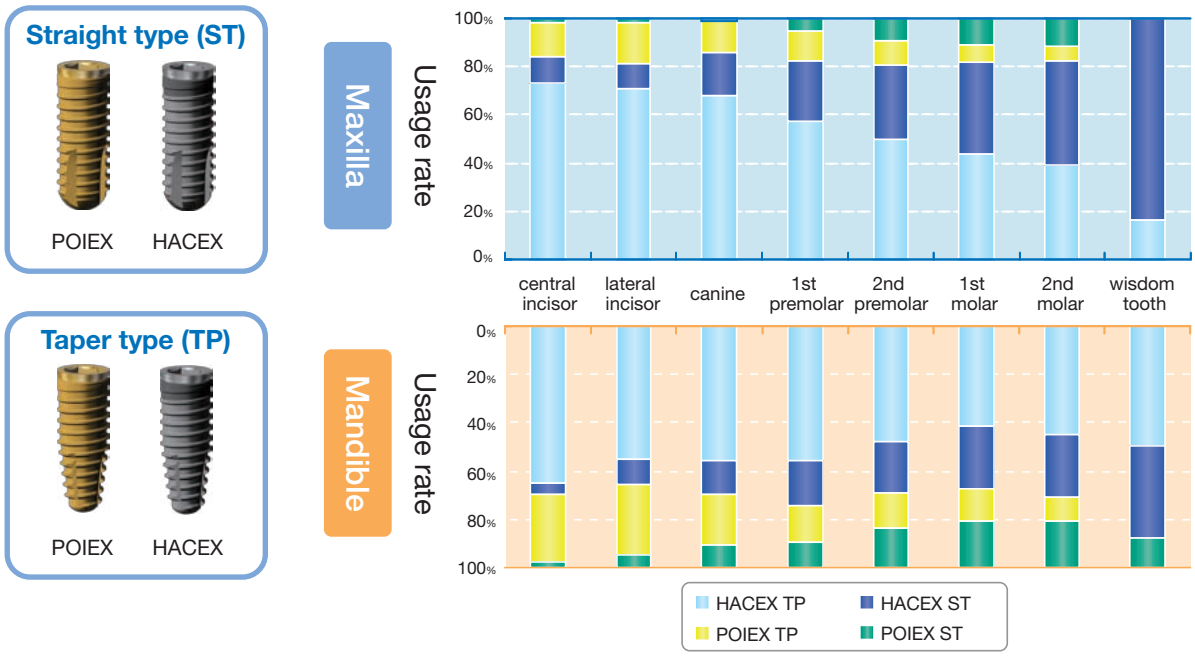


Fig.2 Implant distribution by type of implant

There are taper-type (TP) and straight-type (ST) implants, each of which is available as either anode oxidized for POIEX or HA-coated for HACEX respectively. The bar graphs above show distribution of usage rate by position.
These figures indicate that TP implants were often used in the anterior area of both the maxilla and mandible.

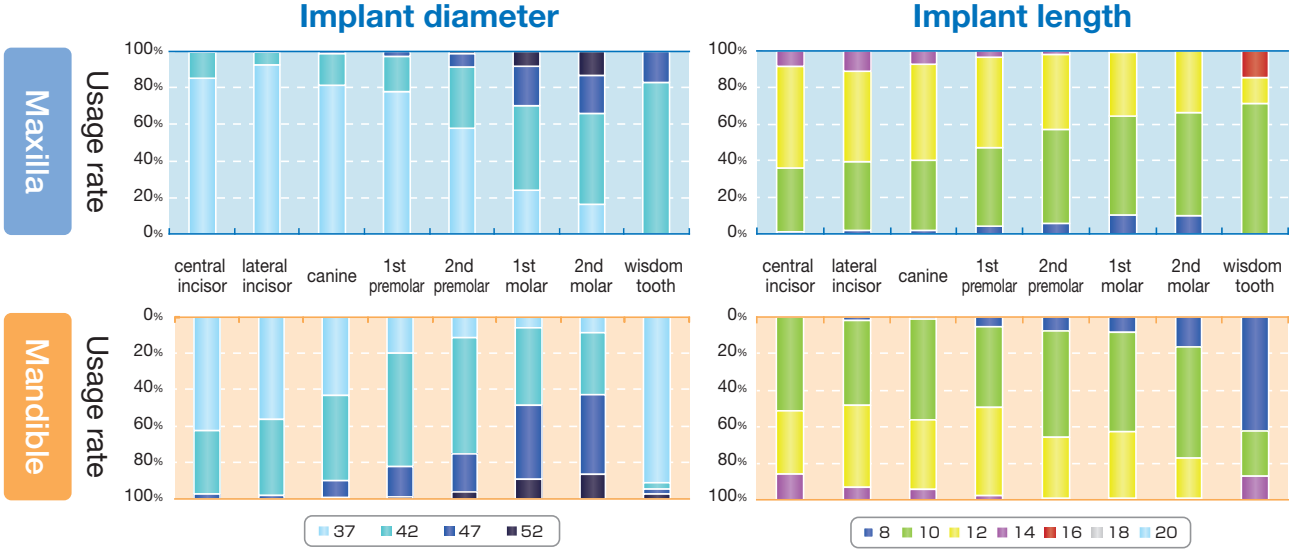


Fig.3 Usage rate distribution by implant size

Implant diameters of 3.7mm to 5.2mm and implant lengths of 8mm to 20mm are available in each type.
In the anterior area, a 3.7mm ϕ implant was most frequently used.
In the molar area (except for wisdom teeth), larger diameters were used more often.
Lengths of 10mm and 12mm were used most frequently.
The majority of 8mm length implants were used in molar area.
Lengths of 18mm and 20mm were not used in any case within this survey.

3. Survival rate

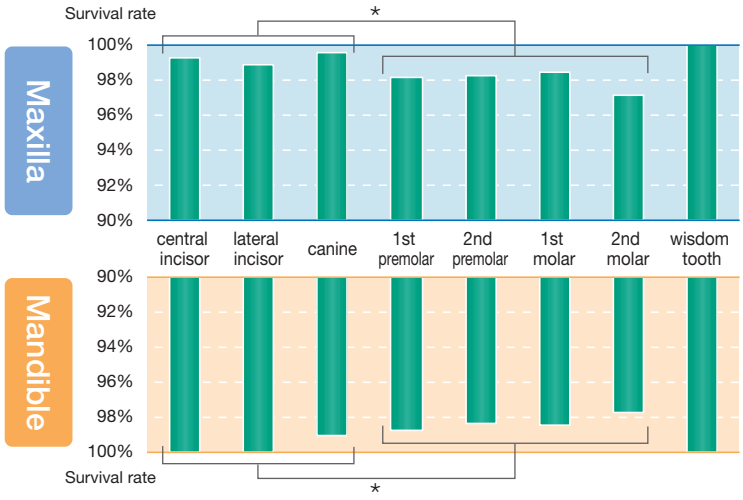


Fig.4 Survival rate

Survival rate was 98.3%

Fig.5 Survival rate by implant position

The bar graphs show survival rate distribution by implant position.
The survival rate exceeded 97% in all positions. Information regarding wisdom teeth was insufficient (6 cases for maxilla, 8 cases for mandible) to compare with that of other areas. Survival rate was lower in the molar area than in the anterior area in both maxilla and mandible (*significant difference P<0.05, t-test).

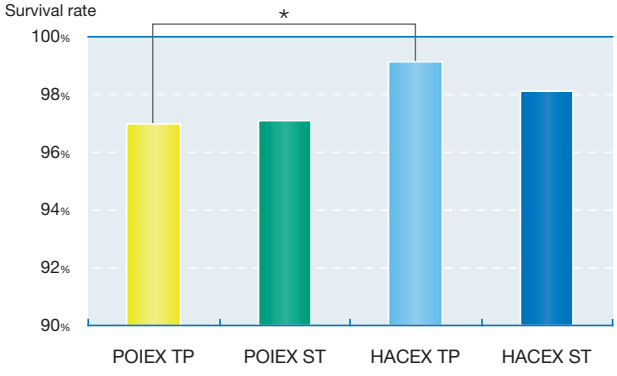


Fig.6 Survival rate by implant type

The bar graph shows survival rate by implant type. The survival rate exceeded 97% for all types. A tendency was observed that the survival rate of HACEX implants was superior to that of POIEX for TP implants (*p<0.05, Fisher's exact test). Significant difference was not noticeable for ST implants; however, the same tendency was found.
Significant difference was not found between ST and TP in both POIEX and HACEX respectively.

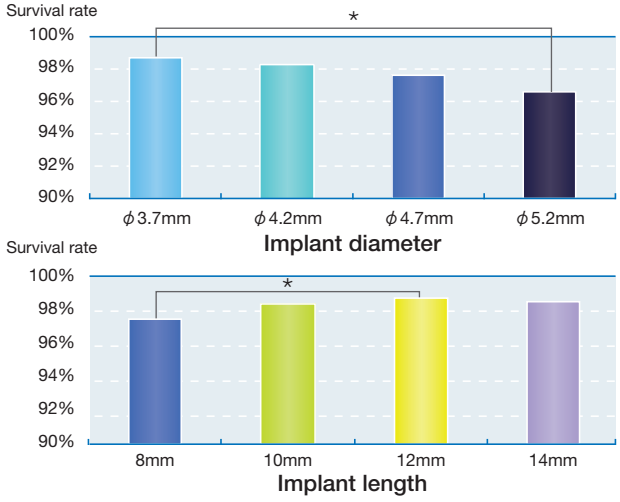


Fig.7 Survival rate by implant size

The bar graphs show survival rate by implant diameter and length. There was a significant difference between 5.2mm and 3.7mm diameters (*P<0.05, Fisher's exact test). Survival rate was lower for larger diameter. Significant difference was found between 8mm and 12mm lengths (*P<0.05, Fisher's exact test). The 12mm length showed highest survival rate.

4. Discussion

The overall survival rate was 98.3% (6,129 survived out of 6,235 implanted).
The survival rates by implant position were 99.5% for anterior mandible, 99.2% for anterior maxilla, 98.1% for posterior mandible, and 97.9% for posterior maxilla.
The molar area (except wisdom teeth) showed a lower survival rate in both the maxilla and mandible (*significant difference P<0.05, t-test). Survival rates for all fixture types exceeded 97%. HACEX showed

98% to 99%, which was higher than that for POIEX. Detailed analysis of molar area, for which the survival rate fell below that of the anterior area, is described below.

1) Cases in molar area

Maxillary molar area (except wisdom teeth)

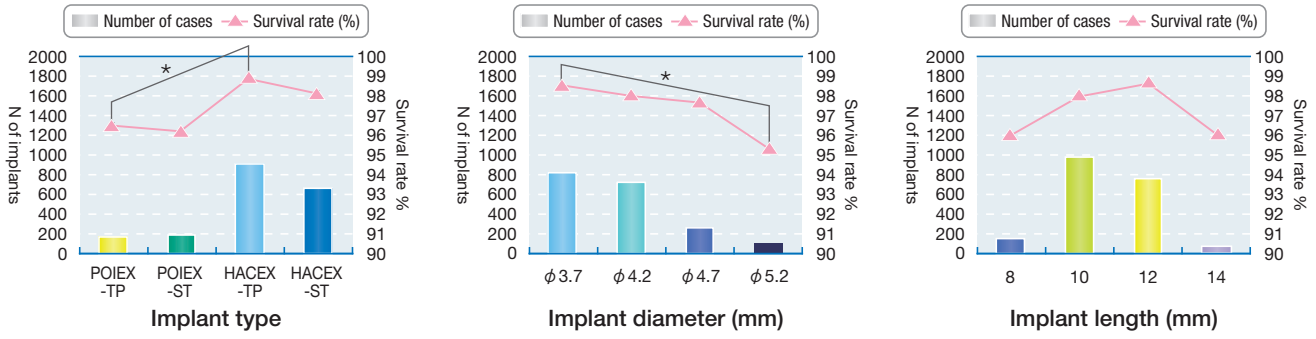
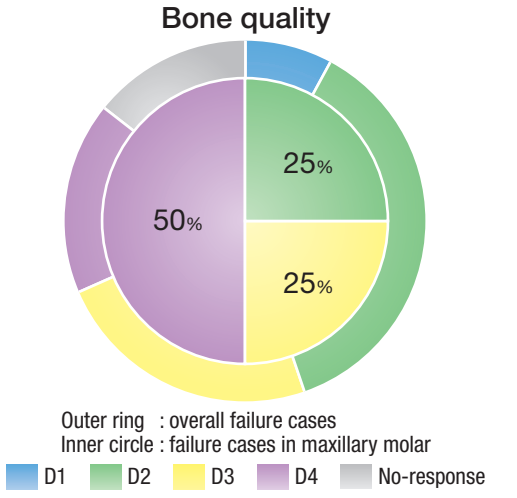
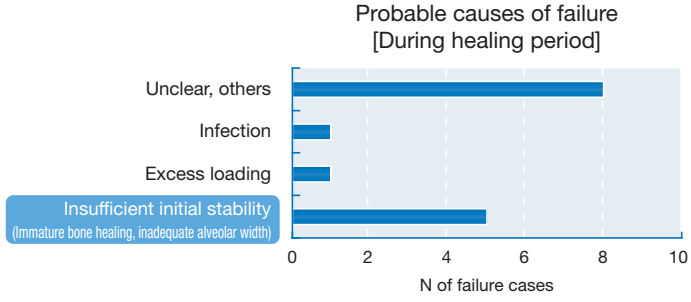
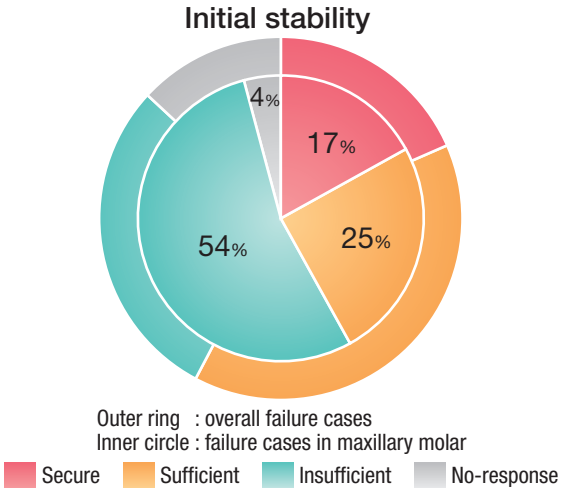


Fig.8 Failure case tendency by implant type in maxillary molar area

As for TP implants, HACEX had higher survival rate than POIEX (P<0.05, Fisher's exact test).
As for ST implants, same tendency was observed.
There was significant difference between implant 3.7mm and 5.2mm diameters (P<0.05, Fisher's exact test). Implants with a larger diameter showed a lower survival rate.
The length 12mm showed the highest survival rate. There was no significant difference between other lengths of implants (P<0.05, Fisher's exact test).







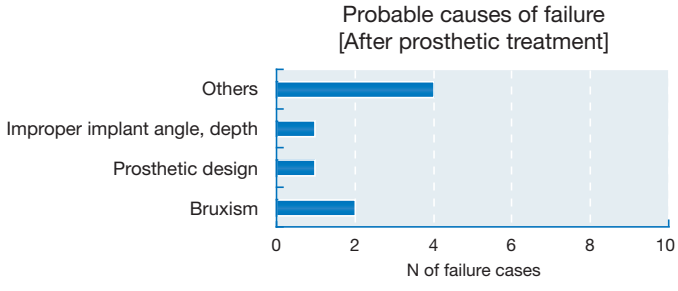


Fig.9 Failure case tendency in maxillary molar area

Outer ring of the circle graph shows overall failure cases tendency.
Cases with D4 bone and insufficient initial stability were frequently observed in the maxillary molar region.
The primary cause of failure during the healing period was insufficient initial stability, which reasonably agreed with tendencies of bone quality and initial stability.

Mandibular molar area except wisdom teeth

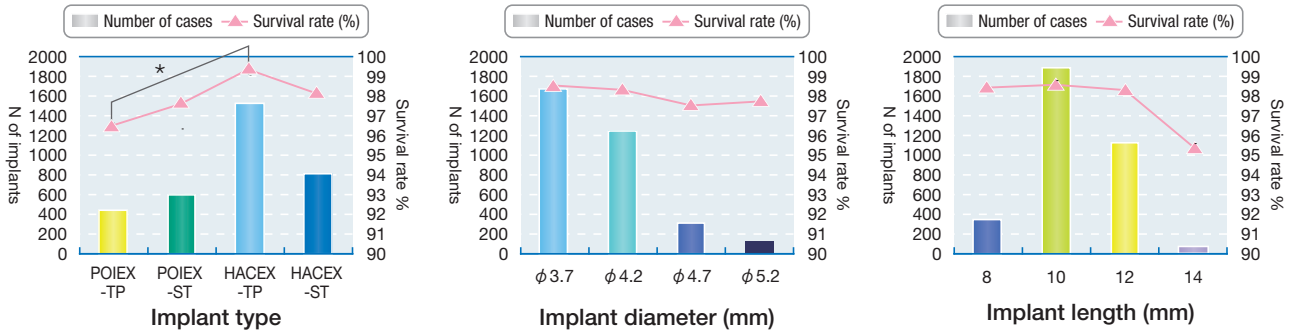
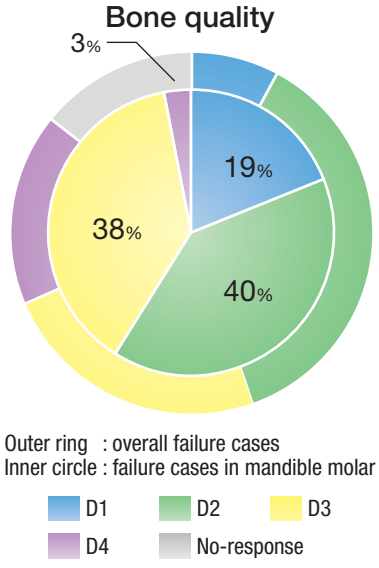
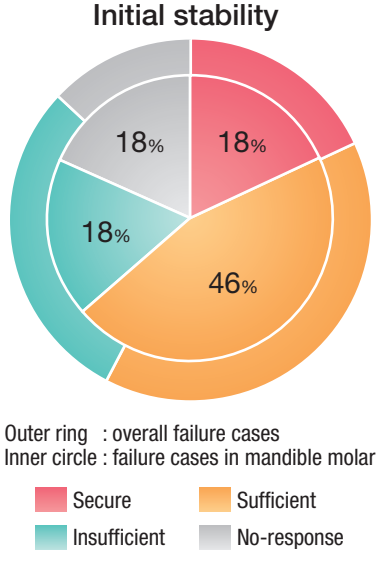
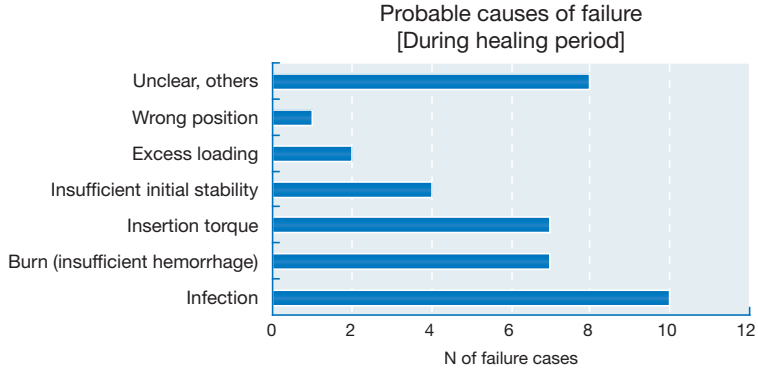


Fig.10 Failure case tendency by implant type in mandibular molar area

As for TP implants, HACEX had higher survival rate than POIEX (P<0.05, Fisher's exact test). For ST implants, the same tendency was observed.
Significant difference was not found between implant diameter and implant length (P<0.05, Fisher's exact test).







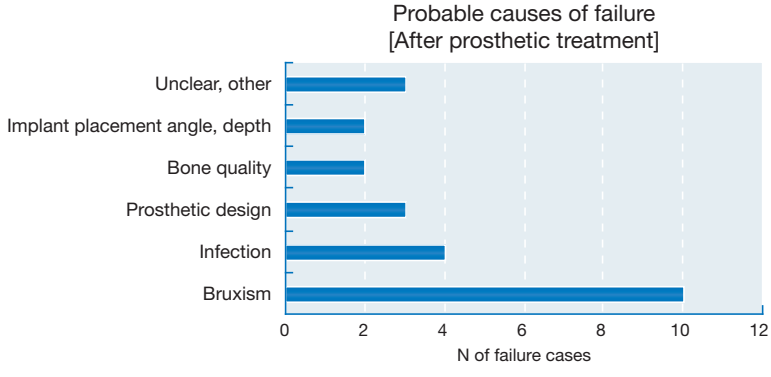


Fig.11 Failure case tendency in mandibular molar

Outer ring of circle graph shows overall failure cases tendency.
D1 and D2 bone quality and insufficient initial stability were observed in mandibular molar area. Burn and infection were major probable causes of failure during healing period, which reasonably agreed with tendencies of bone quality and initial stability.

Ⅱ. The key points for improving survival rate

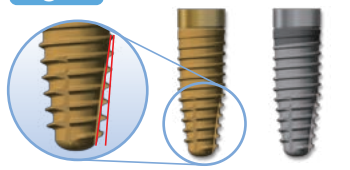
Compliance to basic points is necessary for more stable survival rate.
It is important to note the following in case of molar area which survival rate fell below that of the anterior area.

1. Maxillary molar

The survival rate in maxillary molar area was 97.9%. Notably, 46% of the area was D4 and 60% rated as insufficient initial stability, these rates were higher than those for the other areas.
Primary cause of failure during healing period was insufficient initial stability, which reasonably agreed with tendencies of bone quality and implant stability for failed cases.

Key points
1. To increase initial stability: use TP implants (Fig.12).
2. To achieve early osseointegration: use HACEX implants (Fig.12).
3. To secure sufficient bone volume: increase bone volume by GBR using autograft, and use an implant that is as long as possible (Fig.13).
4. To improve bone quality: use BONE SPREADER in combination with other instruments (Fig.14).
5. To reduce loading during healing period: avoid excess loading during healing period when initial stability is insufficient.

Fig.12

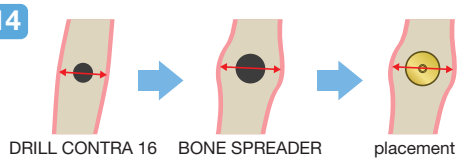


POIEX TP　HACEX TP

Fig.13 **TP implants**

	POIEX			HACEX		
	S (Length of collar 0.5mm)	M (Length of collar 1.5mm)	L (Length of collar 2.5mm)	S (Length of collar 0.5mm)	M (Length of collar 1.5mm)	L (Length of collar 2.5mm)
ϕ3.7mm						
ϕ4.2mm						
ϕ4.7mm						
ϕ5.2mm						

Fig.14



DRILL CONTRA 16　BONE SPREADER　placement

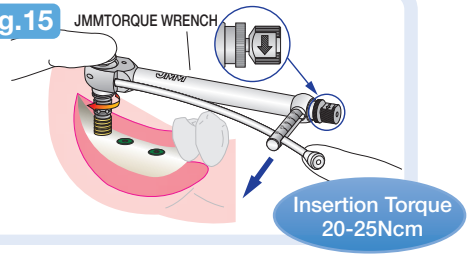
Widening alveolar width

(by BONE SPREADER)

Bone quality improvement

It is recommended to use a BONE SPREADER
in addition to the normal drilling procedure.
Insertion torque for the implant should be 20-25Ncm.
Also It is better to use an implant of smaller diameter
dependent on bone condition.

Fig.15



2. Mandibular molar

The survival rate of mandibular molar area was 98.1%. In the area, 19% was D4, which tends to require a higher insertion torque value.

Key points
1. Use a TORQUE WRENCH (Fig. 15).
2. Use a CORTICAL MILL and a SCREW FORMER to avoid applying too much insertion torque (Fig. 16).

Fig.16

Summary

In order to achieve reliable and predictable results with implants, it is important to avoid excess loading during the healing period as well adopting a staged approach.
We hope you find this clinical report useful for your future implant treatments.

for the patient

JMM JAPAN MEDICAL MATERIALS

Japan Medical Materials Corporation

Head Office
Uemura Nissei Bldg. 8F 3-3-31 Miyahara, Yodogawa-ku,
Osaka 532-0003 Japan
Tel:+81-6-6350-1534 Fax:+81-6-6350-1038

Shiga Gamo Plant
10-1 Kawai-cho, Higashiomi-shi,
Shiga 529-1595 Japan
Tel:+81-748-55-4417 Fax:+81-748-55-4402

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